



Asexual Reproduction

- 1 parent
- ALL of the offspring are **genetically identical** to the parent

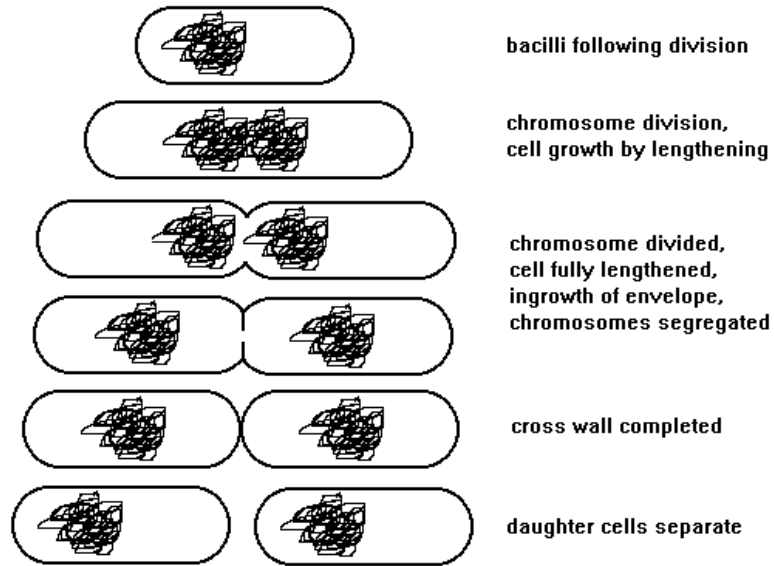
Types

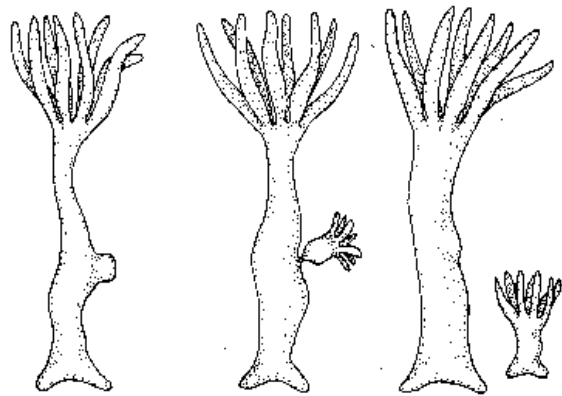
- **Binary Fission** = Bacteria
- **Budding** = Hydra
- **Regeneration** = Starfish
- **Vegetative Propagation/Reproduction**

Asexual Reproduction

Advantages	Disadvantages
<ul style="list-style-type: none">• requires only one parent• no mate needed• faster and easier• rapid population growth• no travel is necessary 	<ul style="list-style-type: none">• no genetic diversity• difficulty in adapting to environmental changes 

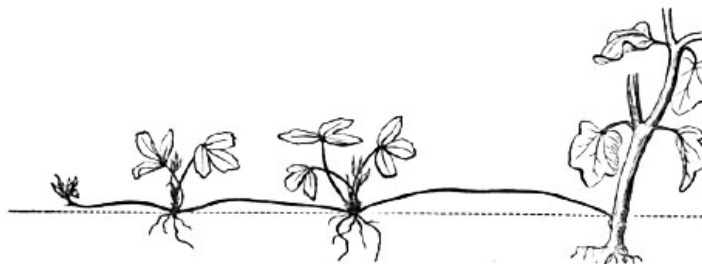
Binary Fission



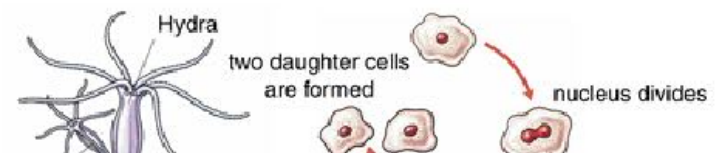
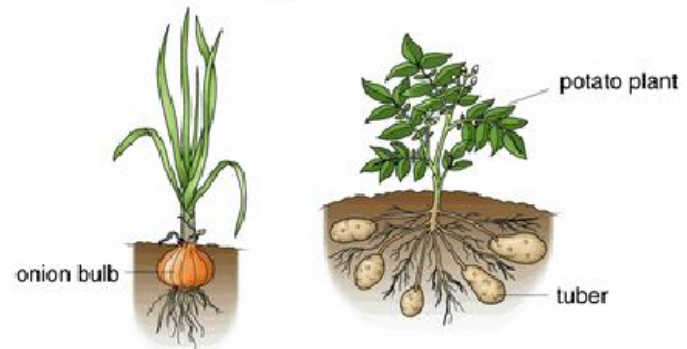
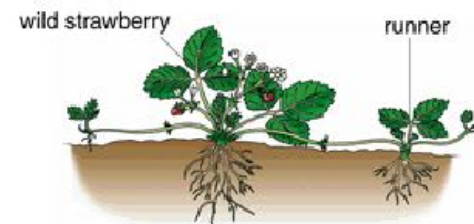


by I. Vignatone © BIO 21040

Scy/97



Asexual reproduction



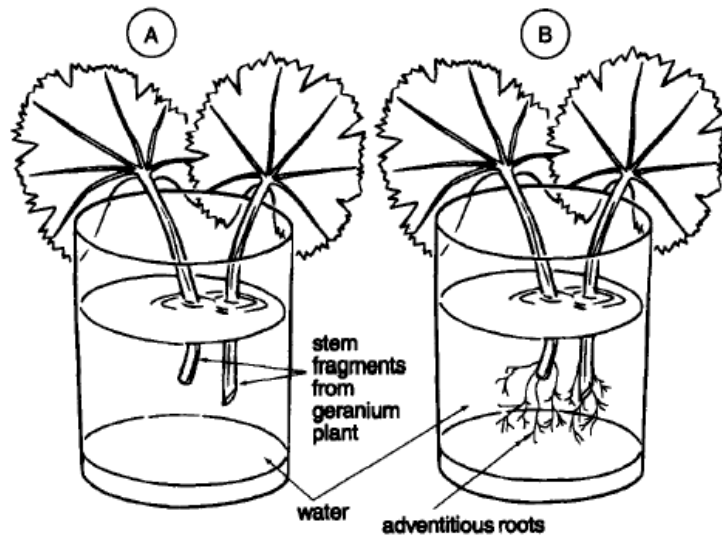


Figure 8.1



Sexual Reproduction

- involves 2 parents
- ALL of the offspring are a genetic combination of **both** parents

Gametes

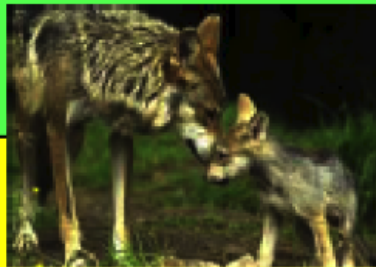
- sperm cells--23 chromosomes
- egg cells (ova)--23 chromosomes



Sexual Reproduction

Advantages

- genetic diversity in species
- ability to adapt to environmental changes



Disadvantages

- requires two parents
- requires time and energy to find a mate and reproduce
- can only produce small populations
- requires travel

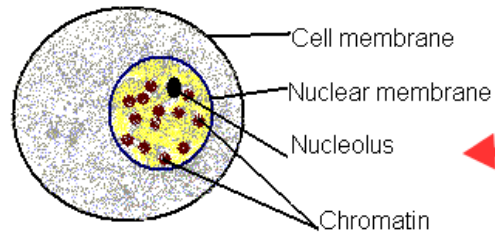


1. Interphase

DNA has replicated, but has not formed the condensed structure of chromosome. They remain as loosely coiled **chromatin**.

The nuclear membrane is still intact to protect the DNA molecules from undergoing mutation.

EN

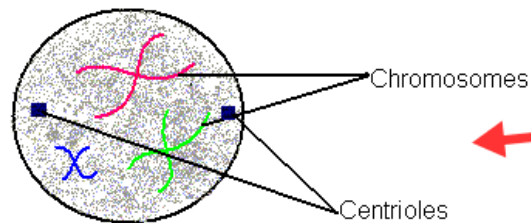


Not a phase of Mitosis!

2. Prophase

The DNA molecules progressively **shorten** and **condense** by coiling, to form chromosomes. The nuclear membrane and **nucleolus** are no longer visible.

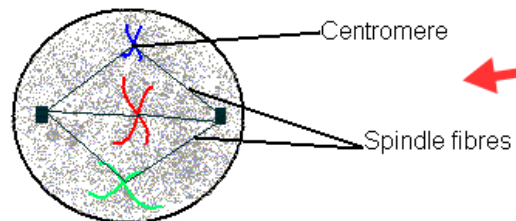
The spindle apparatus has migrate to opposite poles of the cell..



Phase 1 of Mitosis

3. Metaphase

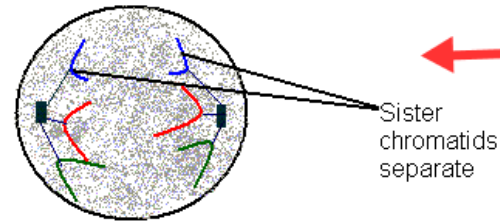
The spindle fibres attach themselves to the **centromeres** of the chromosomes and align the the chromosomes at the equatorial plate.



Phase 2 of Mitosis

4. Anaphase

The spindle fibres shorten and the centromere splits, separated **sister chromatids** are pulled along behind the **centromeres**.

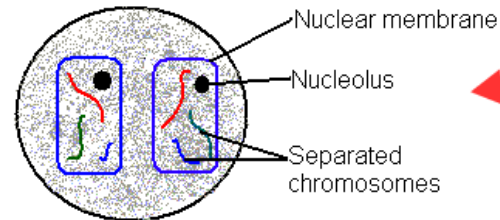


Phase 3

4. Telophase

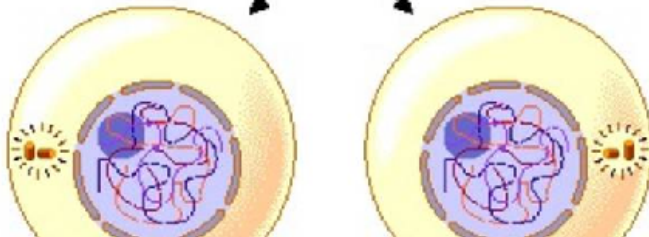
The chromosomes reach the poles of their respective spindles. Nuclear envelope reform before the chromosomes uncoil. The spindle fibres disintegrate.

EN
CE



Phase 4

Cytokinesis



Phase 5